

CLAIMS

1. An image inputting apparatus which reads a document optically and provides image information which corresponds to a document image, the image inputting apparatus comprising:

a light source which irradiates light onto the document;

a four-line CCD sensor which includes a first CCD line sensor which is structured by a three-line CCD sensor in which color filters are respectively disposed on surfaces of light receiving elements, and a second CCD line sensor which is structured by a one-line CCD sensor in which no color filter is disposed, the four-line CCD sensor receiving reflected light from the document and providing an image signal which corresponds to the reflected light;

a driving section which supplies a signal including an image transfer clock to the four-line CCD sensor, and drives the four-line CCD sensor;

adjusting section which adjusts an amplitude of at least one signal among signals outputted from the first CCD line sensor when a color document is read and an amplitude of a signal which is outputted from the second CCD line sensor when a monochrome document is read, to be substantially equal to one another; and

a selecting section which selectively provides output of the first CCD line sensor in a case in which

a color document is read, and selectively provides output of the second CCD line sensor in a case in which a monochrome document is read.

2. An apparatus according to claim 1, wherein the  
5 adjusting section adjusts one signal amplitude among signals which are outputted from the first CCD line sensor, and an amplitude of a signal which is outputted from the second CCD line sensor when a single color document is read, to be substantially equal to one  
10 another, and

the selecting section selectively provides the output of the second CCD line sensor in a case in which the single color document is read.

3. An apparatus according to claim 1, wherein, at  
15 a time of reading a color document and at a time of reading a monochrome document, the adjusting section changes a one scan line reading time of a document by changing a frequency of the image transfer clock which is supplied from the driving section to the four-line  
20 CCD sensor.

4. An apparatus according to claim 3, wherein the adjusting section sets an image transfer frequency at a time of reading a color document to be lower than that at a time of reading a monochrome document.

25 5. An apparatus according to claim 1, wherein the adjusting section includes a light amount changing section which changes a light amount of the light

source at a time of reading a color document and at a time of reading a monochrome document.

6. An apparatus according to claim 5, wherein the light amount changing section sets the light amount at 5 the time of reading a color document to be greater than that at the time of reading a monochrome document.

7. An apparatus according to claim 5, wherein the light amount changing section controls the light amount of the light source such that an amplitude of a signal 10 which is outputted from the second CCD line sensor coincides with an amplitude of a signal whose amplitude is largest among output signals of a three-line CCD sensor which forms the first CCD line sensor.

8. An apparatus according to claim 1, wherein a plurality of light sources are provided, and the adjusting section turns on the plurality of light sources at a time of reading a color document, and turns on one light source among the plurality of light sources at a time of reading a monochrome document.

20 9. An apparatus according to claim 8, wherein the adjusting section sets a light amount of the light source such that an amplitude of a signal which is outputted from the second CCD line sensor when a monochrome document is read by turning on one of the 25 plurality of light sources coincides with an amplitude of a signal whose amplitude is largest among output signals of a three-line CCD sensor which forms the

first CCD line sensor.

10. An apparatus according to claim 1, wherein the adjusting section includes first to third amplifiers which amplify, at first to third amplification factors respectively, output signals of the three-line CCD line sensor which forms the first CCD line sensor, and a fourth amplifier which amplifies an output signal of the second CCD line sensor at a fourth amplification factor which is less than the first to third amplification factors.

15. An apparatus according to claim 10, wherein the adjusting section controls the amplification factors of the first to fourth amplifiers such that amplitudes of the output signals of the three-line CCD sensor which forms the first CCD line sensor and a signal amplitude which is outputted from the second CCD line sensor all coincide.

20. An apparatus according to claim 1, wherein outputs of a plurality of light receiving elements which form the second CCD line sensor are divided into a plurality of groups, and respective groups output serial image signals simultaneously.

25. An apparatus according to claim 1, wherein outputs of a plurality of light receiving elements which form the second CCD line sensor are divided into a plurality of groups, and respective groups output serial image signals simultaneously, and wherein light

amounts of the light source are the same at a time of reading a color document and at a time of reading a monochrome document.

14. An apparatus according to claim 1, further  
5 comprising:

a user interface which is for a user to designate whether a document is a color document, a monochrome document or a single color document,

10 wherein in a case in which the document is designated to be a color document by the user interface, the selecting section selects and provides output of a three-line CCD sensor which forms the first CCD line sensor, and in a case in which the document is designated to be one of a monochrome document and a  
15 single color document, the selecting section selects and provides output of the second CCD line sensor.

15. An apparatus according to claim 1, further comprising:

20 a document automatic sensing section which senses whether a document is a color document, a monochrome document or a single color document,

25 wherein in a case in which the document is detected to be a color document by the document automatic sensing section, the selecting section selects and provides output of a three-line CCD sensor which forms the first CCD line sensor, and in a case in which the document is detected to be one of a

monochrome document and a single color document, the selecting section selects and provides output of the CCD line sensor in which no color filter is disposed.

16. An apparatus according to claim 1, wherein the  
5 image inputting apparatus is connected to a network and is used as a network scanner, and when the image inputting apparatus transmits image information to a computer which is connected via the network, the image inputting apparatus simultaneously transmits an  
10 identification signal which expresses whether an image is a color image which is read by using the color filters or a monochrome image which is read without using a color filter.

17. An image forming apparatus which reads a  
15 document optically and forms an image which corresponds to a document image, the image forming apparatus comprising:

a light source which irradiates light onto the document;

20 a four-line CCD sensor which includes a first CCD line sensor which is structured by a three-line CCD sensor in which color filters are respectively disposed on surfaces of light receiving elements, and a second CCD line sensor which is structured by a one-line CCD  
25 sensor in which no color filter is disposed, the four-line CCD sensor receiving reflected light from the document and providing an image signal which

corresponds to the reflected light;

a driving section which supplies a signal including an image transfer clock to the four-line CCD sensor, and drives the four-line CCD sensor;

5           adjusting section for adjusting an amplitude of at least one signal among signals which are outputted from the first CCD line sensor at a time of reading a color document, and an amplitude of a signal which is outputted from the second CCD line sensor at a time of  
10          reading a monochrome document, to be substantially equal to one another;

15          a selecting section which selectively provides output of the first CCD line sensor in a case in which a color document is read, and selectively provides output of the second CCD line sensor in a case in which a monochrome document is read; and

20          an image forming section which forms an image on a medium on which an image is to be formed, on the basis of image signals which are selectively provided from the selecting section.

18. An apparatus according to claim 17, wherein the adjusting section changes a one scan line reading time of a document by changing a frequency of the image transfer clock which is supplied from the driving section to the four-line CCD sensor, at a time of reading a color document and at a time of reading a monochrome document.  
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19. An apparatus according to claim 17, wherein  
the adjusting section includes a light amount changing  
section which changes a light amount of the light  
source at the time of reading a color document and at  
5 the time of reading a monochrome document.

20. An image inputting method which reads a  
document optically and provides image data which  
corresponds to a document image, the image inputting  
method comprising the steps of:

- 10           irradiating light onto the document;  
              supplying a signal including an image transfer  
clock to a four-line CCD sensor, and driving the four-  
line CCD sensor, wherein the four-line CCD sensor  
includes a first CCD line sensor which is structured by  
15 a three-line CCD sensor in which color filters are  
respectively disposed on surfaces of light receiving  
elements and a second CCD line sensor which is  
structured by a one-line CCD sensor in which no color  
filter is disposed, and receiving reflected light from  
20 the document, and providing an image signal which  
corresponds to the reflected light;
- adjusting an amplitude of at least one signal  
among signals which are outputted from the first CCD  
line sensor at a time of reading a color document and  
25 an amplitude of a signal which is outputted from the  
second CCD line sensor at a time of reading a  
monochrome document, to be substantially equal to one

another; and

selectively providing output of the first CCD line  
sensor in a case in which a color document is read, and  
selectively providing output of the second CCD line  
5 sensor in a case in which a monochrome document is read.